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CLAIMS

1. Method for designing a nuclear fuel assembly (1) which is intended to be positioned in a nuclear reactor, the assembly comprising a plurality of guide tubes (24), and a control cluster (4) which itself comprises a plurality of control rods (10) which are received in the guide tubes (24) and a support (11) for control rods (10), the assembly comprising a helical spring (16) for damping the impact of the support (11) against an upper end piece (7) of the assembly in the event of the control cluster (4) falling during a shutdown of the nuclear reactor, characterised in that the method comprises the following steps:

a) establishing the progression of the speed of the control cluster (4) after the impact of the support (11) against the upper end piece (7),
b) establishing, based on the speed established in step a), a maximum longitudinal load (F_{MAX}) for compression of the spring (16), and
c) establishing, based on the maximum longitudinal load for compression (F_{MAX}), at least a maximum shearing stress (τ_{MAX}) in the spring (16).

2. Method according to claim 1, characterised in that a maximum shearing stress (τ_{MAX}) is a shearing stress along the neutral axis (FN) of the spring (16).

3. Method according to claim 1 or 2, characterised in that a maximum shearing stress is a shearing stress along the axis (F2) of the spring (16) nearest the longitudinal centre axis (A) thereof.

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4.   Method according to any one of the preceding claims, characterised in that it further comprises a step for verifying, using a maximum shearing stress established in step c), that a maximum stress admissible by the spring (16) has not been exceeded.

5.   System for designing a nuclear fuel assembly, characterised in that it comprises means for carrying out the steps of a method according to any one of the preceding claims.

6.   System according to claim 5, characterised in that it comprises a computer (34) and storage means (36), in which at least a programme comprising instructions for carrying out steps of the method for designing a nuclear fuel assembly is stored.

7.   Computer programme comprising instructions for carrying out the steps of a method according to any one of claims 1 to 4.

8.   Medium which can be used in a computer and on which a programme according to claim 7 is recorded.